the sense is spoiled by using run for rim; p. 92 the statement is made that corn has no gluten; p. 105 Austria is said to be in the Baltic basin; p. 106 Chile is given just one climate, the Mediterranean, and is said not to be hospitable to the potato, the country in which the potato originated; p. 119 Japan is credited with one sixth of her land under cultivation. The Japanese are much more modest in reporting the arable area; pp. 288 ff coffee, tea and cacao are treated as *condiments;* p. 292 ff San Domingo is wrongly used as the name of a country; p. 293 a wrong date is given for the abolition of slavery in Brazil; p. 296 Havre is given as the world's greatest coffee market; p. 307 diacritical marks are omitted from the Portuguese form of St. Thomas; p. 330 ff pilagic does duty for pelagic; p. 375 Maderia for Madeira; p. 378 ff the final letter is omitted from Pittsburgh; p. 378 steamboats are given credit for plying to Minneapolis; p. 403 has the great falls of Iguazu on the Parana River; p. 441 the form Austro-Hungary is used, and in another place Austro for Austria; p. 449 Estremaduro for Estramadura; p. 454 states that the Philippine forests belong to the United States government; p. 454 the Philippines are stated as "tree poor," an astonishing statement; p. 445 the tropical cedar used in making cigar boxes is said also to be used in making lead pencils; p. 498 we learn that "wool is covered with minute scales, whereas hair is smooth"; p. 584 Spain, etc., given credit as the source of most of our sulfur supply; p. 617 "plate glass . . . passed between rollers which give it the beautiful smooth surface"; p. 619 "the ancients were better artificers in copper than are the moderns"; p. 627 aluminum is said to be a more efficient "transmitter" of electricity than is copper; p. 637 a legend says "silver production is unusual in that it does not increase." The graph above the legend shows an increase from 72 to 220 in the period covered.

There are many examples of inaccuracy which may be due to loose writing. Such, for example, as p. 172, where the whole Parana valley is made a sheep district like that in Australia; p. 285 vacuum pans are used because there is *less* danger of burning; p. 311 vanilla "is an orchid-*like* vine"—but why continue? There are scores of these faults, little and big, which should not have gone out even in a first edition.

Such errors, while a serious blemish, are not permanent handicaps. Careful editing may remove them. The spirit of the author is so good, his interpretations so suggestive, that when a revision is made the book will stand as the best text-book presentation so far published in this country, of the complex and difficult field of industry and commerce, from the geographic viewpoint. The book can be used with advantage as a text in college classes, where the teacher, if a geographer, may easily accentuate to his taste the purely geographic elements involved.

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THE returns which have come in thus far indicate that the schools should give information from the whole field of science—not neglecting astronomy. The public needs unmistakably require a new organization of science instruction according to *projects.* The problems of life are not differentiated after the manner of specialized science. Pupils in both elementary and high schools are in a much more primitive state of mind in regard to all science than our school programs would indicate. Many are apparently blind and deaf to nature's most evident teachings. They are in the depths of superstition about common things even while surcharged with academic formulas regarding things scientific. Our secondary schools persist in articulating with that which is above them rather than with the elementary school. Few persons appear to know that they have the answers to most of their questions readily accessible in dictionaries, encyclopedias and readable books. Apparently we have deprecated the teaching of science from books too long and too success-

fully. The greatest need, and likewise the greatest demand, among even highly educated persons, is for *information* rather than *training* in science. All workers and students require training in their specialty, but in other fields they want knowledge in simple form and by the most direct method.

Natural science has moved from a position of great worth as a school subject to one of minor importance. Science teachers everywhere are beginning to regard it a high duty to bring it back to its rightful place and value. Attention has been too sharply focused on teaching "subjects" as against teaching students those things that are important for them to know. The schools reached the lowest point in real science instruction when, under the stress of preparing for higher institutions, they narrowed their work to "the forty quantitative experiments." It was desultory, scrappy, unorganized, unscientific. At best the teaching was confined to vocabularies of technical words, definitions of scientific terms, statements of "fundamental principles," etc. The natural and effective order is not principles followed by applications, but the reverse. From a multitude of experiences, facts and observations, arranged so as to illuminate one another, some few principles may be derived; if these principles can be shown to be fundamental and can be brought into immediate use. The trouble with most of the so-called "fundamental principles" is that they are never again met either in school or life, and the majority even of enlightened men get on very well without having ever heard of them, or, having heard, they have forgotten them because they did not prove to be fundamental to anything. A principle which occurs, or is likely to occur, so often that one can not forget it, is fundamental, and few others need be considered.

Principles are not to be taught merely for discipline and training, nor for use only in a remote future.

The study of "projects" in science will necessitate the breaking down of boundary fences that have been erected between highly specialized sciences.

General science should be adapted to local conditions and may not be universalized. Many projects elaborated by ingenious and skilled teachers should be published in a series of small books or pamphlets for the use of pupils. Teachers may select from these as time, place and other circumstances require. Enough of this material may easily be prepared to occupy many years of study on the part of pupils. What it is worth while to know from the fields of astronomy, botany, chemistry, geology, meteorology, physics, physiology, zoology, etc., may be thus acquired.

Correspondence is invited.

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INDIANA UNIVERSITY EXPEDITIONS TO NORTHWESTERN SOUTH AMERICA

IN these columns in 1905, Dr. C. H. Eigenmann gave a discussion of the fresh-water fishes known from both slopes of Panama,[1] and suggested the advisability of a biological survey to record their distribution before the completion of the canal should furnish a waterway and allow the intermingling of the two faunas. His conclusions were, in the main, that the Pacific slope fauna was derived from the Atlantic slope fauna in times more recent than the obliteration of the interoceanic connection, and that this fauna crossed the divide somewhere near Panama. At his suggestion, resolutions were adopted by various scientific bodies, including the International Zoological Congress and the American Association for the Advancement of Science, calling upon the president and congress to provide means for a survey of the regions about the canal. In 1910, under the auspices of the Smithsonian Institution, the survey was organized from among the various scientific departments at Washington. The collection of fishes was intrusted to Dr. S. E. Meek, of the Field Museum of Natural History, and Mr. S. F. Hildebrand,

[1] SCIENCE, N. S., Vol. XXII., No. 549, 1905, p. 18.